

**MILLCREEK TOWNSHIP SEWER AUTHORITY**

MILLCREEK MUNICIPAL BUILDING  
3608 WEST 26TH STREET  
ERIE, PENNSYLVANIA 16506

Phone (814) 835-6721

Fax (814) 835-6615

October 14, 2003

Mr. Anthony Oprendeck  
Pennsylvania DEP  
230 Chestnut Street  
Meadville PA 16335

RE: Kearsarge Pump Station By-pass

Dear Mr. Oprendeck:

This communication is the required follow-up to the bypassing of the Kearsarge sewage pump station which occurred on September 29, 2003 and which you had previously been notified by fax.

The by-pass was initiated under the direction of Richard Bridger, the Township Sewer and Water Superintendent. It was necessary to do this as well as pump from West 51<sup>st</sup> Street and Zimmerly to prevent basement flooding. The series of events that lead up to this included the rain events attributed to hurricane Isabel which saturated the ground and raised the water table and finally an intense localized storm which dumped a purported 1.85" of rain in a one hour period on Monday morning on Kearsarge and Summit Township.

Our Engineering Consultant, CTE Engineers, was present the entire time of the bypassing and authored the attached report, which will serve as the calculation of the amounts by-passed. The Report shows the following flows estimated to be by-passed:

From the Kearsarge P.S.	=	1,019,780 gallons
From 51 <sup>st</sup> & Zimmerly	=	<u>108,000</u> gallons
Estimated Total	=	1,127,780 gallons

In accordance with the current Consent Order and Agreement, we have enclosed a check for \$5,000.

Please advise this writer if there are any questions. There were no other sewage discharges for the month of September 2003.

Very truly yours,  
Millcreek Township Sewer Authority

By: \_\_\_\_\_  
George W. Riedesel, P.E., Manager

Cc: M.T.S.A.  
Mlk. Supervisors  
Evan Adair  
S.T.S.A.

**MSA-MT 3013**



ENGINEERS

CONSOER TOWNSEND ENVIRODYNE ENGINEERS, INC.

155 West 8th Street

October 6, 2003

Erie, Pennsylvania

Mr. George Riedesel, P.E.  
Millcreek Township Sewer Authority  
3608 West 26<sup>th</sup> Street  
Erie, PA 16506

Phone: (814) 453 4394

Dear Mr. Riedesel:

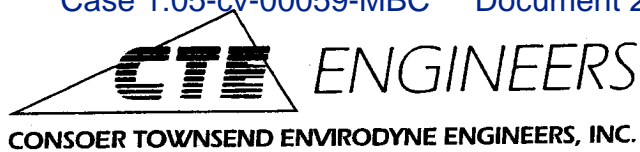
Fax: (814) 455 6596

In response to your request we have assessed the overflow that occurred from the Kearsarge pump station on Monday, September 29, 2003. That overflow began at approximately 8:20 a.m. and was finally discontinued at 3:15 p.m. The black graph on the attached figure is a representation of the volumes of flow discharged from the pump station during those periods. The total flow represented by that graph did not pass through the bypass. A good portion passed through the force main and entered the downstream sewers reaching the Erie Wastewater Treatment Plant.

We estimated the amount of flow going forward in the force main by measuring the discharge pressure of the pumps which are indicative of the amount of flow that passes through the full length of the force main. The nomograph used to make that estimate had been calculated previously to judge and determine the friction factor of the force main. It was adjusted following this incident since pumped flows over 4,000 gpm had not previously been observed being discharged through the pipeline because at those times the siphon was fully active. The estimated flows going forward are represented in green in the attached figure.

The discharge was opened to approximately thirteen turns at 8:20 a.m. and then throughout the day was closed and reopened at various intervals to determine if the discharge could be stopped (see nomenclature at the top of the attached). Toward the end of the overflow period the overflow valve turns were reduced until it was completely shut off. The graph presented demonstrates the times that the overflow was turned off to determine if it could be ceased. That determination was made by observing the wet well and noting whether the pumps were capable of keeping up with the influent flows (wet well levels are represented in red on the attached figure). Three such attempts were made until the bypass discharge was finally terminated at

MSA-MT 3014



Mr. George Riedesel, P.E.  
October 6, 2003  
Page 2

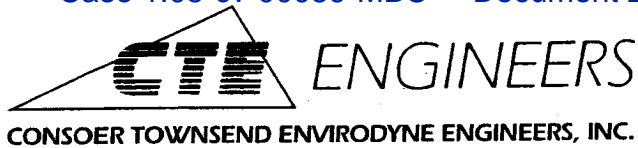
approximately 3:15 p.m. The unsuccessful attempts at stopping the bypass occurred at 12:00 noon, 1:45 p.m., and at 2:30 p.m.

From the discharge pressures noted at the pump station it is estimated that between 4,000 and 3,600 gpm of the flows pumped went forward to the wastewater treatment plant, depending upon the time of day and the number of turns made on the overflow valve. The total amount of the overflow is estimated to have averaged 2,600 gpm. We estimated approximately 2,439,780 gallons were pumped by the station during periods when the overflow was active. Of that amount between 1,440,000 and 1,420,000 gallons were discharged forward to the wastewater treatment plant and between 999,780 and 1,019,780 gallons were discharged through the overflow.

There was a second overflow. During the same approximate time wastes were pumped from the manhole at 52<sup>nd</sup> and Zimmerly, also into Walnut Creek. This operation began at 8:30 a.m. and was stopped at 12:30 p.m. The suction varied between 1 foot and 9.6 ft. and during the last hour the pump was sucking air periodically because the water level was at or slightly below the end of the suction pipe.

A 4-inch trash pump was utilized and upon checking with a contractor, it was determined that such a pump will discharge between 400 and 450 gpm with a negative suction of approximately 6 ft. Pumping at this rate for a period of four hours yields a total pumpage of 108,000 gallons.

We have been unable to determine for sure why the siphon did not initiate. The system differed only in the fact that a new vacuum air release valve had been installed at the high point in the force main. This device should have allowed the siphon to initiate much more dependably than in the past when the old unit had been plugged and nonfunctional. Once the flow decreased to below that necessary to maintain the siphon, it should allow air to enter. Once the flows had passed their peak and were beginning to fall off, we instructed the plant personnel to close the air/vacuum release valve so that it would function more in line of the way it had previously functioned. The siphon was still not initiated during any of the two times that the bypass was stopped to determine if it would. However, at the very end of the storm, it was noticed that the siphon did initiate. This is observable because flows will increase beyond that of what is the normal capacity of the pumps and the system pressure will drop indicating that there is a suction being applied to



Mr. George Riedesel, P.E.

October 6, 2003

Page 3

the effluent side of the pumps. At the same time it was noted that the pumps began to cycle up and down because of this increased flow (i.e. flows would reach the levels necessary to initiate the siphon and then decrease below the levels necessary to maintain it).

However, on Wednesday evening following a rainfall, it was again noted that the wet well was beginning to fill and an alarm had been sounded. Although no bypass was necessary, the wet well did fill to the first landing elevation 302.5 and the siphon did not initiate even though flows reached levels where the siphon had initiated previously.

We can only suggest at this time that the vacuum relief valve be replaced simply with an air release valve. This will allow any entrapped air to be released but conversely when the siphon is broken and the waters begin to recede, air will not be allowed back into the pipe. This then may allow the siphon to initiate itself more quickly when flows increase. That could very well be the situation that is occurring but we are by no means certain.

We hope this report provides the information that is necessary. We did find that your personnel made every attempt to minimize the amount of waste that was being bypassed with the purpose primarily being to prevent problems in households.

Very truly yours,

CONSOER TOWNSEND ENVIRODYNE ENGINEERS, INC.

Gerald C. Allender, P.E.  
Project Manager

GCA:lb

Enclosure

MSA-MT 3016



PROJECT <i>MTSA</i>			JOB NO.
SUBJECT <i>Kearsarge P.S. flows</i> <i>9/29/03</i>			SHEET
DESIGNED	DATE	CHECKED	DATE

